

REMARKS

In response to the Office Action dated June 18, 2007, claims 1, 11, 12, 13 and 22 are amended. Claims 1-22 are now active in this application. No new matter has been added.

As a preliminary matter, form PTOL-316 acknowledges a claim for foreign priority, and marks the box “All,” but does not mark any of the boxes identifying what type of supporting priority documents have been received. **Applicants request that the supporting priority documents be properly identified.**

Additionally, form PTOL-316 asserts that claim 20 is rejected. However, the body of the Office Action does not contain any treatment of claim 20. **Applicants request that claim 20 be explicitly examined.**

Claim 11 is objected to regarding insufficient antecedent basis. Applicants submit that this objection has been overcome by the foregoing amendments.

Claims 1-3, 5-7, 10-11, 13-15, 17-18, and 21 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Kataoka et al. (U.S. 6,133,522) in view of Kloppel et al. (U.S. 2003/0170449). This rejection is traversed.

Claims 4, 12, 16, and 22 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Kataoka in view of Kloppel and further in view of Morizane et al. (US 2001/0045505). This rejection is traversed.

Claims 8 and 19 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Kataoka in view of Kloppel and further in view of Goda et al. (U.S. 2001/0016263). This rejection is traversed.

Claim 9 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Kataoka in view of Kloppel and further in view of Kitae et al. (U.S. 2001/0005053). This rejection is traversed.

Independent claim 1 recites, in pertinent part, “**a photovoltaic element including a transparent conductive oxide film having arithmetic mean deviation of the profile of not more than about 2 nm and a paste electrode**, formed on said transparent conductive oxide film, containing at least a metal material and a resin material, said resin material containing at least about 60 percent by weight and not more than about 100 percent by weight of epoxy resin, and having an electric wire connected to the paste electrode.” Independent claim 1 provides a photovoltaic device including a transparent conductive oxide film and a past electrode formed thereon in which the transparent conductive oxide film having arithmetic mean deviation of the profile within a prescribed range and the paste electrode including epoxy resin of a prescribed content are employed whereby the characteristics are improved and the paste electrode can be inhibited from separating from the transparent conductive oxide film.

Independent claim 13 recites, in pertinent part, “**a photovoltaic element including a transparent conductive oxide film provided with a surface having a contact angle of at least about 40° and not more than about 74° with respect to water** and a paste electrode, formed on said transparent conductive oxide film, containing at least a metal material and a resin material, said resin material containing at least about 60 percent by weight and not more than about 100 percent by weight of epoxy resin, and having an electric wire connected to said paste electrode. Claim 13 is similar to claim 1, except that surface roughness limitation is expressed in an indirect fashion through the water “contact angle.” The present specification, at page 35, line 23 to page 36, line 8, and FIG. 8, explains the correlation between a contact angle and a surface roughness. Specifically, FIG. 8 of the Application shows that a surface roughness, for example, of 1 nm (horizontal axis) corresponds to a contact angle of about 55 degrees.

In order to establish a *prima facie* obviousness rejection under 35 U.S.C. § 103(a), all the claim limitations must be taught or suggested by the prior art. *In re Rokya*, 490 F. 2d 981, 180 USPQ 580 (CCPA 1974). Further, “rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *In re Kahn*, 441 F. 3d 977, 988 (Fed. Cir. 2006).

The Office Action, at page 3, admits that Kataoka does not teach or suggest “transparent conductive oxide film having arithmetic mean deviation of the profile of not more than about 2 nm.”

Additionally, the Office Action, at page 3, asserts that Kloppel discloses a transparent conductive oxide film having arithmetic mean deviation of the profile of not more than about 2 nm and a paste electrode at paragraph [0013] (“ITO films . . . smooth surface with a surface roughness of less than 1 nm”) and paragraph [0005] (“ITO films . . . rough surface . . . will reduce the useful life”).

However, Kloppel, at paragraph [0013], states “a surface roughness of less than 1 nm and **a specific resistance that amounts to less than 200 $\mu\Omega\text{cm}$, especially in the range between 140 and 160 $\mu\Omega\text{cm}$.**” Thus, Kloppel merely discloses a film with a very high specific resistance, and does not provide any rational for using this film in a photovoltaic element.

The Office Action cites paragraph [0005] of Kloppel (“rough surface and the so-called ITO spikes have the effect that when the ITO film is used as electrode, the spikes act as field peaks and will therefore reduce the useful life of, for example, organic LED cells when such ITO films are used with organic LED displays”) as a reason to combine the smooth surface limitation of Kloppel with the other limitations from Kataoka.

However, the high resistance of the Kloppel film is not useful in the photovoltaic element of claim 1. Thus, the rejection does not provide adequate rational underpinning to support the legal conclusion of obviousness.

Claim 13 is similar to claim 1, except that surface roughness limitation is expressed in an indirect fashion through the water “contact angle.” Specifically, 1 nm surface roughness of Kloppel appears approximately equivalent to a 55 degree contact angle. See FIG. 8 of the Applicants’ specification. Thus, the discussion provided above for claim 1 regarding also applies to claim 13.

Thus, Applicants respectfully submit that independent claims 1 and 13 are allowable over the cited art.

Under Federal Circuit guidelines, a dependent claim is allowable if the independent claim upon which it depends is allowable because all the limitations of the independent claim are contained in the dependent claims, *Hartness International Inc. v. Simplimatic Engineering Co.*, 819 F.2d at 1100, 1108 (Fed. Cir. 1987).

Thus, as independent claims 1 and 13 allowable for the reasons set forth above, it is respectfully submitted that all dependent claims 1-12 and 14-22 are allowable for at least the same reasons.

Accordingly, it is urged that the application, as now amended, is in condition for allowance, an indication of which is respectfully solicited. If there are any outstanding issues that might be resolved by an interview or an Examiner's amendment, Examiner is requested to call Applicants' attorney at the telephone number shown below.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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